

## SOME NEW ASIAN SNAKES.

BY

CAPTAIN F. WALL, I.M.S., C.M.Z.S.

(WITH 2 PLATES.)

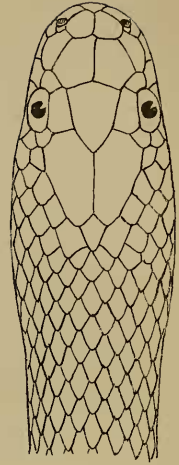
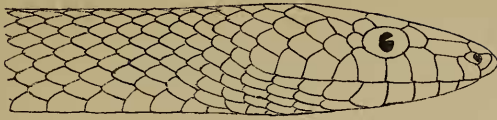
*(Read before the Bombay Natural History Society on 24th Jan. 1907.)**LYCODON FLAVOMACULATUS.*

This snake is interesting from the fact that though hitherto undescribed it is not, as one might infer, recently discovered. On the contrary more than one specimen has been preserved in the Bombay Natural History Society's collection for several years labelled as *Lycodon jara*. It was only when one of these examples came under the notice of Mr. Boulenger at the British Museum that this identification was disputed, and since this time there has been much perplexity regarding these specimens. Mr. Boulenger considered the one he saw merely a variety of *Lycodon aulicus*.

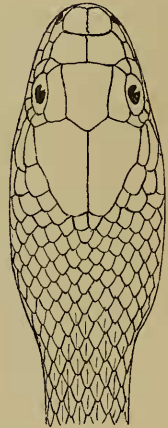
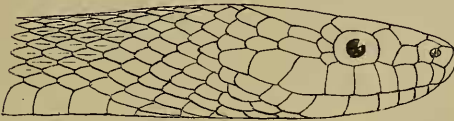
Last year Mr. Millard sent me two specimens to identify, and I unhesitatingly pronounced them colour varieties of *L. jara*, being led into the same error as he and others by the key to the genus *Lycodon* in Mr. Boulenger's catalogue of snakes in the British Museum (Vol. I., pp. 348-9) which could lead one to no other conclusion. The description, too, in that work accorded perfectly with the specimens referred to me, except in colour, a point I deem of little importance in itself, and always vastly inferior to scale characters. One has only to refer, for instance, to *L. aulicus* to see how multiform may be the colour and markings of a single species.

Recently another fine living example of this species reached the Society's rooms from Mrs. C. Hudson, of Dharwar, and this I took to the British Museum for identification. With Mr. Boulenger I examined the type and other specimens of *L. jara*, and agreed with him that they were different from this specimen. I was also able by a comparison with the specimens of *L. aulicus* to point out differences between them and this specimen, and to convince that authority that this is a distinct species.

From *L. aulicus* it differs thus :—(1) the ventrals are not angulate ; (2) the nasals touch only one supralabial (the 1st), whereas these shields in *aulicus* almost always touch the 2nd also ; (3) the minute posterior nasal ; (4) colour.



1.



2.



J. Green del et lith.

NEW INDIAN SNAKES.

1. *Lycodon flavomaculatus*. 2. *Tropidonotus xenura*.

From *jara* the most obvious difference lies in its very distinctive colouring. In addition to this, however, is the fact that in *flavomaculatus* the postnasal shield is very small, decidedly smaller than in *jara*.

The scale characters of the two appear to me otherwise identical. I have now examined 6 specimens of *L. flavomaculatus*, which exactly agree. Five of these belong to the Bombay Natural History's collection and were obtained from Sangli (S. Maratha District), Kirkee, Poona, Nasik, and Dharwar, all places on the Western Ghats inside the Bombay Presidency. The 6th example was in the Fyzabad Museum until recently, but has now been presented to the British Museum. There is no record of habitat.

*Description.*—*Rostral* in contact with 6 shields, the sutures made with the anterior nasals being twice those made with the internasals. *Internasals*, a pair; the dividing suture about two-thirds that between the præfrontal fellows, subequal to the internaso-præfrontal suture. *Præfrontals*, a pair; the dividing suture about one-third greater than the præfronto-frontal suture; in contact with the internasal, loreal, præocular, supraocular, and frontal. *Frontal*, in contact with 6 shields, all sutures subequal, or the supraocular rather longest; length about one-third greater than supraocular; breadth about twice supra-oculars. *Nasals*, in contact with one supralabial only (the first). *Loreal*, one, twice as long as high; in contact with internasal; not entering eye. *Præocular*, one; not touching frontal. *Postoculars*, two. *Temporals*, two; the lower in contact with 6th and 7th supralabials (sometimes 5th also). *Supralabials*, 9; the 3rd, 4th and 5th touch the eye. *Infralabials*, the 6th is the largest of the series, twice as broad as the posterior sublinguals, and in contact with 3 scales behind; the 5th and 6th touch the posterior sublinguals; suture between the 1st  $\frac{3}{4}$  or subequal to the suture between the anterior sublinguals. *Ventrals* not angulate, 165 to 182. *Anal*, divided. *Subcaudals*, 53 to 62 pairs. *Scales*, 2 heads lengths from head 17; midbody 17; 2 heads lengths before vent 15. Smooth. *Colour*, glistening jet black, with a series of buttercup yellow roundish vertebral spots, opposite which whitish bars descend and broaden to form a reticulation in the flanks. The vertebral spots involve about 2 scales, and the intervals 4 or 5. No occipi'al collar. Head black with white lips. Under parts pearly white. The living specimen after being put into spirit lost its brilliant yellow in about three days, the spots being then as white as the flank bars. It was  $13\frac{3}{4}$

inches in length, and all the other specimens I have seen are of about the same dimensions.

This is the second new *Lycodon* I have had the honour of describing within a year, and the total number of species now known to inhabit our Indian territory amounts to 11.

Without wishing to commit myself too positively I think the following characters, if found co-existing, will identify the *Lycodon* group—

- (1) Scales in midbody in 19 or 17 rows.
- (2) Scales two headslengths before vent 2 rows less than in midbody.
- (3) Pupil vertical.\*
- (4) Three labials touching the eye.†

Key to the Species of *Lycodon*.

A.—NO LOREAL.

- (a) Labials 8 ..... *mackinnoni*.
- (b) Labials 9 ..... *atropurpureus*.

B.—ONE LOREAL WHICH DOES NOT TOUCH THE INTERNASAL.

- (a) Scales in midbody 17.
  - \* Labials 8 ..... *fasciatus*.
  - \*\* Labials 9 ..... *travancoricus*.
- (b) Scale in midbody 19.
  - \* Labials 8 ..... *gammiei*.
  - \*\* Labials 9 ..... *carinatus*.

C.—ONE LOREAL WHICH TOUCHES THE INTERNASAL—

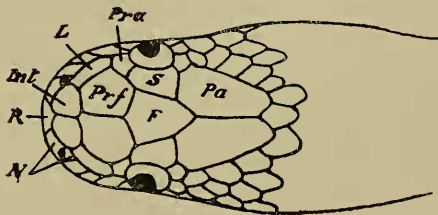
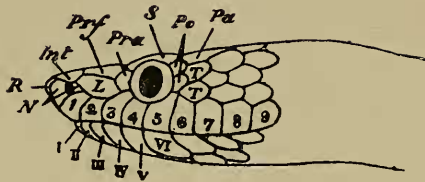
- (a) Labials 8 ..... *striatus*.
- (b) Labials 9
  - \* Nasals touch 1st and 2nd labials; præocular usually touches frontal ..... *aulicus*.
  - \*\* Nasals touch 1st labial only; præocular does not touch frontal
    - o Brown with a pair of white spots on each scale... *jara*.
    - oo Black with vertebral series of yellow spots ..... *flavomaculatus*.

D.—LOREALS TWO. .... *anamallensis*.

\* The pupil can never be discerned in the *Lycodons* during life, but the earliest *post mortem* change to be observed which may be revealed in a couple of hours, or even less, is a steadily increasing opacity of the lens, whereby the shape of the pupil becomes obvious. Immersion in spirit brings about the same change more rapidly.

During life, or in a freshly killed specimen, this jet-black condition of the eye added to points 1 and 2 given above will suffice to declare the genus, for in all other snakes with the same optical peculiarity, the scales at a point 2 headslengths before the vent, are disposed in the same number of rows as in midbody.

† Except *L. atropurpureus* in which the 4th and 5th only touch the eye. This taken with the first 3 conditions enumerated will suffice to distinguish it from all our other Indian snakes.



F. Frontal.  
 L. Loreal.  
 I. Internasals.  
 N. Nasals.  
 Pa. Parietals.  
 Pra. Praeocular.  
 Prf. Praefrontals.

Po. Postoculars.  
 R. Rostral.  
 S. Supraocular.  
 T. Temporals.  
 1-9 Supralabials.  
 I-VI. Infralabials.



The following scheme should assist the identification of the species, —in fact I think is even preferable to that usually adopted in a key.

Subcaudals.	Rows of scales mid-body.	Loreals.	Loreal touching internasal.	Supralabials.*	Supralabials touching the eye.	Ventrals angulate.	Anal.	Supralabials touching nasal.	Preocular touching frontal.	Name of Species.
All entire ..	19	1	No.	9	3rd, 4th & 5th.	Yes.	1	1st & 2nd.	No.	<i>carinatus.</i>
All paired ..	19	1	No.	8	Do.	Yes.	1	1st & 2nd.	No.	<i>gammiti.</i>
Do. ..	17	2	Yes.	9	Do.	Yes.	1	1st.	Yes.	<i>anamallensis.</i>
Do. ..	17	0	—	8	Do.	Yes.	2	1st.	No.	<i>mackinnoni.</i>
Do. ..	17	0	—	9	4th & 5th.	Yes.	1	....	No.	<i>atrapurpureus.</i>
Do. ..	17	1	No.	8	3rd, 4th & 5th.	Yes.	1	1st & 2nd.	No.	<i>jasaiatus.</i>
All paired or some entire.	17	1	No.	9	Do.	Yes.	1	1st & 2nd usually.	Usually.	<i>travancoricus.</i>
All paired ..	17	1	Yes	9	Do.	Yes.	1 or 2	1st & 2nd usually.	Usually.	<i>auilicus.</i>
Do. ..	17	1	Yes.	8	Do.	No.	2	1st & 2nd.	No.	<i>striatus.</i>
Do. ..	17	1	Yes.	9	Do.	No.	2	1st.	No.	<i>flavomaculatus.†</i>
Do. ..	17	1	Yes.	9-10	Do.	No.	2	1st.	No.	<i>jara.†</i>

Here I may remark that many people appear to expect a key to direct them unerringly in every case to the object of their enquiry, but the disciple of Darwin on a little reflection must see how impossible it is to fulfil such expectations, for it is only through variation that the evolution doctrine can be accepted. Whether the variation is retrograde—a reversion to an ancestral type,—or progressive—a

\* A caution must here be offered to the novice, to count these shields very carefully. It is very easy to omit counting the last, and to prevent this the mouth should be well opened to show the extreme limit of the gape. Again it is often easy to overlook the contact of the 3rd with the eye, and it will be seen by a glance at the scheme how either of these mistakes will misdirect the enquirer.

† A most critical examination of these two species side by side reveals to me no other shield difference but that already referred to in connection with the postnasal. Recourse had better be had therefore to colour only. In *flavomaculatus* the jet black ground with the white flank bars, and reticulation, and the brilliant yellow vertebral spots are very striking and characteristic. In *jara* the ground colour is brown, and each scale has a pair of small whitish (Theobald says yellow) spots at its apex. It is doubtful whether habitat will help in discriminating between the two; for although the only authentic localities where *flavomaculatus* has been met with are confined to a moderately elevated region in the Bombay Presidency, the fact that there was a specimen in the Fyzabad Museum, though its habitat is known, suggests a wider distribution. *Jara* has been met with in Malabar, the Anamally Hills, Sikkim, Himalayas, Ganjam, Calcutta, Pegu and recently the Bombay Natural History Society has acquired its first specimen, the habitat being Tindaria (Kurseong) on the Darjeeling-Himalayan Railway.

deviation towards a new type, the effect is the same, and certain individuals must occur which depart in some way or other from the accepted normal type. This being so, any key however well constructed will fail to correctly indicate certain individual specimens. In framing keys one endeavours to select characters which are found to be most stable in individuals of the same species, so as to minimise the chances of misleading.

TROPIDONOTUS XENURA, *spec. nov.*

The habitat of this very interesting snake is not recorded. That it belongs to this genus I have little doubt, though it differs from all the other known species (80 in number) European, Asian, African, Australian and American in having the subcaudals entire. The entire anal too is a character only as yet known in one other of the many Asian species, *viz.*, *T. pealii*. Another very unusual feature about this snake is in connection with the supracaudals. These scales in snakes where the subcaudals are in pairs are arranged in even rows. I know of no exception to this rule. On the other hand in snakes such as the genera *Bungarus*, *Aspidura*, *Achalinus*, etc., where the subcaudals are entire, the supracaudals are arranged in odd rows, and even in those snakes where a combination of entire and divided subcaudals exist, as *Bungarus bungaroides*, *Naia bungarus*, *Ancistrodon acutus*, etc., I have always found the supracaudals arranged in odd rows corresponding to the entire subcaudals, and even rows corresponding to the divided subcaudals. In this snake however the supracaudals are arranged in even rows though the subcaudals are entire.

*Description*—*Rostral*, in contact with 6 shields, of which the anterior nasals form larger sutures than the internasals. *Internasals*, a pair; the suture between them subequal to that between the præfrontal fellows, subequal to the internaso-præfrontal suture. *Præfrontals*, a pair; the suture between them subequal to the præfronto-frontal suture; in contact with internasal, postnasal, loreal, præocular, supraocular, and frontal. *Frontal*, touches 6 shields, of which the supraocular sutures are longest and about  $\frac{1}{3}$  longer than those formed with the parietals. *Supraocular*, length subequal to frontal; breadth  $\frac{1}{3}$  frontal. *Nasals*, divided; in contact with 1st and 2nd supralabials. *Loreal*, rather longer than high. *Præocular*, one; not touching frontal. *Eye*, pupil uncertain. *Postoculars*, 3. *Temporals*, 2; the lower touching the 7th

and 8th supralabials. *Supralabials*, 9, the 4th, 5th and 6th touching the eye. *Anterior sublinguals*, much smaller than posterior. *Posterior sublinguals*, touch the 5th and 6th infralabials. *Infralabials*, 6. The 5th and 6th largest, and subequal. The 6th broader than the posterior sublinguals. *Scales*, 2 heads lengths behind head 19; midbody 19; 2 heads lengths before vent 17. All strongly keeled except the last row anteriorly. *Ventrals*, 162, not angulate. *Anal*, entire. *Subcaudals*, entire, 25 counted but the tail is very incomplete. *Colour*, blackish-brown with whitish spots mottling in the flank. Many labials bordered posteriorly with blackish-brown. Belly with a pair of roundish lateral blackish-brown spots on each ventral.

*TROPIDONOTUS BAILEYI*, *spec. nov.*

Of this snake Lieut. F. M. Bailey has sent me two specimens. One I take to be an adult and measures about 2 feet 6 inches; the other appears to be a hatchling, as the navel is very obvious. It measures  $11\frac{1}{2}$  inches. Both were obtained in Thibet at an altitude believed to be about 14,000 feet. This is a very remarkable elevation at which to find snakes living. The only other instance, of which I am aware, where a snake has been captured at an approximate altitude is that reported by Dr. H. Gadow\* who found a rattlesnake (*Crotalus triseriatus*) in the mountains of Mexico at height of 12,500 feet. Mr. Bailey was informed by the natives, one of whom he sent to procure these specimens, that they live in the sides of a hot spring, and are never found as far as half a mile distant. They are reported not to enter the water, and can be obtained in winter and summer alike. It appears to be common. Both specimens were captured about the 15th May this year. I believe it is unusual for the young of snakes to hatch in the spring in temperate climates, as this appears to have done, the autumn is the season when the eggs are deposited, and young born.

*Description*.—*Rostral*, touches 6 shields, of which the anterior nasals make much the largest sutures, 4 or 5 times the length of the internasals, which are much the shortest. *Internasals*, a pair; the suture between them  $\frac{2}{3}$  to  $\frac{3}{4}$  that between the præfrontal fellows;  $\frac{2}{3}$  to  $\frac{3}{4}$  the internaso-præfrontal suture. *Præfrontals*, a pair; the suture between them  $\frac{1}{4}$  greater than the præfronto-frontal suture; in contact with internasal, postnasal, loreal, præocular, supraocular,

\* Proc. Zool. Soc., London, June 1905, p. 226.



and frontal. *Frontal*, touches 6 shields, of which the supraoculars make the largest sutures, about  $\frac{1}{3}$  larger than the parietals. *Supraocular*, length subequal to frontal; breadth  $\frac{3}{4}$  frontal. *Nasal*, divided, in contact with the 1st and 2nd supralabials. *Loreal*, one, length exceeds height. *Præoculars*, two, the upper larger not touching the frontal, lower above level of supralabials. *Eye* with round pupil. *Postoculars*, three. *Temporals*, three, the lowest smallest, and touching the 6th and 7th supralabials; the median touching the 7th supralabial. *Supralabials*, 8; the 4th and 5th touching the eye. *Anterior sublinguals*, larger than the posterior. *Posterior sublinguals*, quite separated, in some specimens subdivided into two, in contact with the 5th and 6th infralabials (4th and 5th on right side in larger specimens). *Infralabials*, 6, the 6th largest, and rather broader than the posterior sublinguals. *Scales*, 2 heads lengths, behind head 19; midbody 19; 2 heads lengths before vent 17. All keeled except last row. Double apical facets very indistinct, but undoubtedly present. *Ventrals*, 203 and 204; not angulate. *Anal*, divided. *Subcaudals*, 111 and 108. In the adult 103rd to 106th, 108th to 110th are entire, the rest divided; in the young 23rd to 25th, 81st to 85th and 88th to 90th are entire, the rest paired. *Colour*, olive green, with five series of indistinct spots dorsally, most pronounced in the forebody, and in the young specimen fading behind, except the vertebral series which remains quite evident. Last 3 rows with dusky mesial lines and the last row bordered above and below with whitish. A dusky postocular streak, and dusky posterior edges to the labials. Belly bluish-grey, each ventral black basally. The young specimen is darker than the adult, and the body is very depressed.

Since writing the above I have received more than 20 more specimens of this species from the same source which agree with the above. Ventrals vary from 201 to 221. The subcaudals from 91 to 111.